

# STRONG CHILDREN'S RESEARCH CENTER

## Summer 2016 Research Scholar

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### ABSTRACT

**Title:** Prevalence of Childhood Food Allergy Among Older Order Mennonites in Upstate New York

**Background:** The prevalence of allergic disease and asthma has been on the rise in Western countries for the past 50 years.<sup>1</sup> The hygiene hypothesis has become one of the leading theories describing this drastic and continued shift. This hypothesis states that improvements in hygiene and living conditions in developed countries have inhibited certain early-life microbial exposures that are normally instrumental in the development of the infant immune system. A growing number of studies have supported this hypothesis, and have found that environmental and lifestyle factors associated with growing up on a farm are protective against the development of allergic rhinitis, atopic dermatitis, and asthma.<sup>2-5</sup> Our recent study found that an Old Order Mennonite community living mostly on farms and located in Penn Yan, New York has a significantly lower rate of physician-diagnosed asthma, atopic dermatitis, and allergic rhinitis than the general U.S population.<sup>6</sup> Despite such findings there remains little evidence of the farm effect being protective against the development of food allergies. It has been shown that a farm lifestyle may be inversely associated with food allergen sensitization, but no farm studies have assessed food allergy prevalence specifically.<sup>7</sup> With rates of food allergy having increased nearly 50% from 1997 to 2011 and the cost to society of pediatric food allergies estimated at \$25 billion annually, further study is needed.<sup>8-9</sup>

**Objective:** To fill a major gap in the literature describing the farm effect on the development of food allergy, we sought to assess the prevalence of food allergy among the Older Order Mennonite population in Penn Yan, New York. Surveys were distributed to a sample of families in the community, and queried food allergy status of parents and the children, time of introduction of solid foods to the children, and length of exclusive and total breastfeeding. Survey questions were adapted from the National Health and Nutrition Examination Survey (NHANES) for comparison between the Mennonite and general U.S. populations.

**Results:** Analysis revealed the overall prevalence of self-reported food allergy in the community to be 4.53% (95% CI, 3.29% - 6.05%). Among Mennonite children this rate was 4.97% (95% CI, 3.42% - 6.94%), and 3.59% (95% CI, 1.81% - 6.34%) among parents. For comparison, NHANES reports national prevalence rates of 8.96% (95% CI, 8.32%-9.60%) total, 6.53% (95% CI, 5.69%-7.37%) for children, and 9.72% (95% CI, 8.94%-10.5%) for adults.<sup>10</sup> To further assess the true prevalence of pediatric food allergy, all families that indicated a child with a food allergy were contacted for a phone interview. A history was taken to focus on the child's food allergic reactions, as well as a dietary history to determine if the child was avoiding the food. It was determined that only 28.1% of the reported pediatric food allergies were likely or possible food allergies, yielding a prevalence of 1.24% (95% CI, 0.54%-2.43%).

Mennonites introduced solids to their children at the following mean ages: milk (11.3 months, [10.9-11.8]), yogurt (7.11 months, [6.65-7.56]) fruits (7.06 months, [6.62-7.51]), vegetables (7.92 months, [7.26-8.58]), grains (8.48 months, [7.94-9.01]), kefir (8.29 months, [7.05-9.52]), meats (10.1 months, [9.49-10.7]), soy products (10.7 months, [9.61-11.7]), seeds (15.5 months, [13.5-17.5]), egg (8.87 months, [8.43-9.31]), peanut (20.7 months, [18.7-22.6]), tree nuts (21.0 months, [19.5-22.5]), fish (14.7 months, [13.0-16.3]), and shellfish (18.5 months, [15.1-22.0]).

Rate of breastfeeding was high, 99.8% (95% CI, 99.6%–100%). The mean length of exclusive breastfeeding was 7.40 months (95% CI, 7.08-7.72), and the mean total length of breastfeeding was 13.4 months (95% CI, 13.0-13.7).

**Conclusion:** The current feeding guidelines recommend the introduction of highly allergenic solid foods between 4 and 6 months of life, as delaying past 6 months may increase the risk of food allergy.<sup>9</sup> Despite significant delay in solid food introduction, Old Order Mennonite children have lower rates of food allergy than the general US population. This points to other factors – lifestyle and environmental – that are responsible for such a low prevalence of food allergies. This study provides rationale for using the OOM community as a model population for low rate of food allergies, and validates future studies that seek to elucidate specific mechanisms by which the protective effect from the development of allergic diseases occurs.

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